

ADDITIONAL FEE:

Please charge any insufficiency of fee, or credit any excess, to Deposit Account No. 50-0427.

R E M A R K S

The Office Action issued March 18, 2004 has been received and its contents have been carefully considered.

Claims 1-4 have been rewritten as claims 5-15. Of these new claims, only claim 5 is independent.

Submitted herewith for the approval of the Examiner are copies of Figs. 1, 2, 3 and 5 of the drawings with proposed amendments indicated in red. The motors 1 and 2 in Figs. 1 and 2 have been indicated as M1 and M2, respectively. Fig. 1 illustrates the configuration wherein the two motors are mechanically connected in tandem to a drive shaft of the motor vehicle, and Fig. 2 illustrates the configuration in which the two motors are connected in tandem to an axle of the motor vehicle. Since these two configurations are mutually exclusive, the specification has been amended slightly to eliminate a misdescription of these drawings.

The transition relay has been inserted in Fig. 3 and the letters "N.O." and "N.C." have been deleted from Fig. 5.

Claim 5, the only independent claim in this application, recites drive apparatus which comprises two DC electric series motors mechanically coupled to rotate together and adapted to be connected mechanically to the drive wheels of a motor vehicle. The two power terminals of each motor receive power via two input power leads L1 and L2. In a first mode of operation, the two motors are connected in series between the power leads L1 and L2; in a second mode, the motors are connected in parallel between the leads L1 and L2. Electric switch contacts are provided for selecting between these two modes.

When in the first mode, the two motors share the voltage from the line source L1, L2 and therefore operate in a slower speed range than the speed range of the second mode.

Dependent claim 6 recites that one or both motors may be provided with a shunt field winding that is connected to the power leads L1 and L2. In this operational mode, the motors operate in still another speed range, which may be higher than the speed ranges of the first and second modes.

None of the references cited by the Examiner teaches or suggests a drive apparatus which operates in the two modes

set forth in claim 5, not to mention the three modes of claim 6. The U.S. Patent No. 6,105,696 to Chen discloses an electric motor vehicle having two electric motors, one for the forward axle of the vehicle and one for the rear. These motors are connected in parallel to the source of DC voltage (battery 7) as shown in Fig. 2 of the patent.

As may be readily seen, Chen does not teach or suggest any means for switching between a series connection and a parallel connection of the two motors.

The U.S. Patent No. 6,586,668 to Shugar et al. discloses a photovoltaic (PV) roof assembly for an electric golf cart. This reference contains no disclosure at all as to how the electric motors of the golf cart are configured and powered.

The U.S. Patent No. 5,512,022 to Suzuki discloses an electric drive mechanism for motor vehicles in which a first, relatively large motor and a second, relatively small motor are connected to a common "differential gear unit" such as the planetary gear unit shown in Fig. 5. The first motor provides a first input on a first rotating shaft, and the second motor provides a second input and a second

rotating shaft. The output of the differential gear unit is applied to a third rotating shaft.

The motors are electrically connected in the manner shown in Figs. 10-18. In none of these configurations are two DC motors, which are coupled mechanically to rotate together, operated in series in a first mode and in parallel in a second mode.

The U.S. Patent No. 6,089,341 to Gingerich discloses an electric powered vehicle which has a separate DC motor mechanically driving each rear wheel. In the electrical system shown in Fig. 4, each electric motor is separately controlled. There is no possibility of connecting these two motors in series.

Similarly, the U.S. Patent No. 5,481,460 to Masaki discloses an electric vehicle which uses a separate three phase induction motor to drive each front wheel. DC motors are not employed nor can they be connected in series.

The U.S. Patent No. 6,175,217 discloses an electronic system for controlling the output of an electric generator. There is no teaching or suggestion of using two DC motors, connected alternatively in series and in parallel, as a load for this system.

Finally, the U.S. Patent No. 6,491,120 to Ogburn discloses a hybrid motor vehicle powered by both an internal combustion engine 12 and a single electric motor 20. The mechanical outputs of these two energy sources are passed through a common gear assembly 24. The drive apparatus of Ogburn thus fails to include two DC motors on a common drive train.

Since all of the formal issues raised by the Examiner have been overcome by this Amendment, and since applicants' claim 5, the only independent claim in this application, defines a drive system which is neither disclosed nor suggested by the prior art, this application is believed to be in condition for immediate allowance. A formal Notice of Allowance is accordingly respectfully solicited.

Respectfully submitted,

By

  
Karl F. Milde, Jr.

Reg. No. 24,822

MILDE & HOFFBERG, LLP  
10 Bank Street - Suite 460  
White Plains, NY 10606  
(914) 949-3100

I hereby certify that this correspondence is being deposited with the United States Postal Services as first class mail in an envelope addressed to: Commissioner for Patents, Alexandria, VA 22313-1450

on

JUNE 10, 2004

MILDE & HOFFBERG, LLP

By



Date

JUNE 10, 2004